ABSTRACT OF THE DISCLOSURE

A low cost and scalable processes for producing nanostructured $LiFe_xM_{1-x}PO_4$ and nanostructured $LiFe_xM_{1-x}PO_4/C$ composite powders, where $1 \leq x \leq 0.1$ and M is a metal cation, such as Mn, Co, Ni, and V. Electrodes made of either nanostructured $LiFe_xM_{1-x}PO_4$ powders or nanostructured $LiFe_xM_{1-x}PO_4/C$ composite powders exhibit good electrochemical properties. The electronic conductivity of nanostructured $LiFe_xM_{1-x}PO_4$ powders is enhanced by intimately mixing them with ultrafine carbon particles. Thus, the use of nanostructured $LiFe_xM_{1-x}PO_4/C$ composite powders will lead to high power density, low cost and environmentally friendly rechargeable Li-ion batteries.